

Name _____

Quiz #11
Mathematics 309a Abstract Algebra
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Suppose $\langle G, * \rangle$ and $\langle G', *' \rangle$ are groups and that $\phi: G \rightarrow G'$ is a homomorphism.

Let $K = \{x \in G \mid \phi(x) = e'\}$, where e' is the identity element of G' . [Something is an element of K , if ϕ sends it to e' .]

A. If e is the identity element of G , show that $e \in K$. [Consider $\phi(e * e)$.]

B. Show that if $x, y \in K$ then $x * y \in K$. [Consider $\phi(x * y)$.]

C. Show that if $x \in K$ then $x^{-1} \in K$. [Consider $\phi(x * x^{-1})$.]

D. From A, B, and C we can conclude that K is _____.

E. Show that if $x \in K$ and $g \in G$ then $g^{-1} * x * g \in K$. [Consider $\phi(g^{-1} * x * g)$.]